

REMARKS

Claims 23-25 are now pending in this application. Claim 59 has been canceled. Claims 23 and 24 have been amended, and are the independent claims under consideration.

Drawings

The drawings were objected to under 37 CFR 1.83(a). Specifically, the Action notes that the “BPSG region as recited in claim 23, and the drain as recited in claim 25 must be shown or the feature(s) canceled from the claim(s)”. In response, Applicant hereby requests the Examiner’s approval of the changes to Figure 2G proposed above. For the Examiner’s convenience, in addition to being summarized below, the changes appear in the attached drawing sheet. Please amend Figure 2G to include reference numeral “46” illustrating the “BPSG region” and reference numeral “49” illustrating “the drain” region, as indicated in red on the attached copies of this figure. Paragraph [0031] of the specification has been amended to add a specific reference to each of these regions.

An indication of the Examiner’s approval of each of the foregoing proposed changes is respectfully requested in the next Patent Office communication.

Specification

The specification was objected to as failing to provide proper antecedent basis for the claimed subject matter, and specifically to the limitation recited in each of Claims 23, 24 and 29 of “a trench which extends through said body and said substrate”. Each of Claims 23 and 24 have been amended to correct this typographical error and specifically to recite “and into said substrate”, and Claim 59 has been canceled. These amendments are believed to render the objection to the specification moot and withdrawal of same is therefore respectfully requested.

Claim Objections

Claim 59 was objected to for various informalities. The cancellation of Claim 59 renders the objections moot.

Section 112, second paragraph rejection

Claim 23 was rejected under 35 USC 112, second paragraph, as indefinite. Specifically, the Action states that the limitation in Claim 23 of “each of said gate electrodes has a BPSG region *associated with it*”. Claim 23 has been amended to address this matter and is believed to fully comply with the requirements of Section 112. Reconsideration and withdrawal of the Section 112 rejection are respectfully requested.

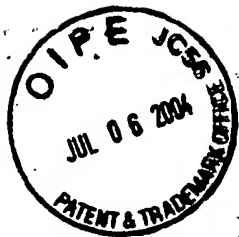
Section 102 and 103 Rejections

Claims 24, 25 and 59 were rejected under 35 USC 102(b) as being anticipated by US Patent 5,567,634 (Herbert et al.); Claim 24 was rejected under 102(e) as being anticipated by US Patent 6,461,918 (Calafut); and Claim 23 was rejected under 35 USC 103(a) as being unpatentable over Calafut.

Each of the rejections of the claims is respectfully traversed in view of the amendments to independent Claims 23 and 24.

Claim 23, as amended herein, is directed to a trench DMOS made by providing an article comprising a substrate of a first conductivity type and a body region of a second conductivity type, the article having a trench which extends through the body region and into the substrate, depositing a gate oxide layer in the trench, forming a gate in the trench, the gate having a first layer comprising undoped polysilicon, a second layer comprising doped polysilicon, and a third layer comprising a material selected from the group consisting of polycide and refractory metals, and forming a source region in the body region, wherein the source region is formed after the gate oxide layer is deposited, and wherein the source region is formed with a junction depth of less than about 0.5 μm . The trench DMOS comprises a plurality of gate electrodes, and each of the gate electrodes has a BPSG region extending over a top portion of the gate.

Claim 24 has been similarly amended herein and also recites that the source region is formed after the gate oxide layer is deposited.



Herbert and Calafut *do not teach or suggest* a trench DMOS made by the steps recited in each of Claims 23 and 24 in which a gate, having a first layer comprising undoped polysilicon, a second layer comprising doped polysilicon, and a third layer comprising a material selected from the group consisting of polycide and refractory metals, is formed in a trench. For at least the foregoing reason, Applicants submit that each of independent Claims 23 and 24, as amended herein, is patentable over the Calafut and Herbert.

It is respectfully submitted that in regard to the above amendment and remarks that each of the pending claims is now clearly in condition for allowance. Should the Examiner be of the view that an interview would expedite consideration of the application, request is made that the Examiner telephone the Applicants' attorney at (908) 518-7700 in order that any outstanding issues be resolved.

Respectfully submitted,

Karin L. Williams

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